CLAIMS:

1. A micro-structured optical fibre for transmitting at least a predetermined wavelength of light, said optical fibre having an axial direction and a cross section perpendicular to said axial direction, said optical fibre comprising:

a core region having a multiplicity of spaced apart core features that are elongated in the fibre axial direction and disposed in a core material, said core region having an effective index of refraction $N_{co}$,

a cladding region surrounding said core region, said cladding region comprising a multiplicity of spaced apart cladding features that are elongated in the fibre axial direction and disposed in a first cladding material, and said cladding region having an effective index of refraction $N_{cl}$, wherein a plurality of said cladding features have a cross-sectional dimension perpendicular to said axial direction being larger than said predetermined wavelength.

2. A micro-structured optical fibre according to claim 1, wherein the effective index of refraction of the core region, $N_{co}$, is larger than the effective index of refraction of the cladding region, $N_{cl}$, at said predetermined wavelength of light.

3. A micro-structured optical fibre according to claim 1 or 2, wherein the refractive index of one or more of the core features is lower than the refractive index of the core material.

4. A micro-structured optical fibre according to claim 3, wherein the refractive index of a majority or all of the core features is lower than the refractive index of the core material.

5. A micro-structured optical fibre according to claim 1, 2 or 3, wherein the refractive index of one or more of the core features is higher than the refractive index of the core material.

6. A micro-structured optical fibre according to claim 1 or 2, wherein the refractive index of a majority or all of the core features is higher than the refractive index of the core material.

7. A micro-structured optical fibre according to any of the claims 1-6, wherein the refractive index of one or more of the cladding features is lower than the refractive index of the cladding material.

8. A micro-structured optical fibre according to claim 7, wherein the refractive index of a majority or all of the cladding features is lower than the refractive index of the cladding material.

9. A micro-structured optical fibre according to any of the claims 1-7, wherein the refractive index of one or more of the cladding features is higher than the refractive index of the cladding material.

10. A micro-structured optical fibre according to claim 1-6, wherein the refractive index of a majority or all of the cladding features is higher than the refractive index of the cladding material.

11. A micro-structured optical fibre according to any of the claims 1-10, wherein said predetermined wavelength is selected from wavelengths in the interval of 0.3 μm to 2 μm.

12. A micro-structured optical fibre according to claim 11, wherein said predetermined wavelength is selected from wavelengths in the interval of 0.6μm to 1.2 μm.

13. A micro-structured optical fibre according to claim 12, wherein said predetermined wavelength is selected to be about 0.78 μm, about 0.98 μm, or about 1.06 μm.

14. A micro-structured optical fibre according to claim 11, wherein said predetermined wavelength is selected from wavelengths in the interval of 1.2 μm to 1.6 μm.

15. A micro-structured optical fibre according to claim 14, wherein said predetermined wavelength is selected to be about 1.3 μm.

16. A micro-structured optical fibre according to claim 11, wherein said predetermined wavelength is selected from wavelengths in the interval of 1.5 μm to 1.6 μm.

17. A micro-structured optical fibre according to claim 16, wherein said predetermined wavelength is selected to be about 1.55 μm.

18. A micro-structured optical fibre according to any of the claims 1-17, wherein said optical fibre is dimensioned to transmit light of said predetermined wavelength in a single mode of propagation.

19. A micro-structured optical fibre according to claim 18, wherein the optical fibre is dimensioned to transmit light in a single mode of propagation for a range of wavelengths below said predetermined wavelength.

20. A micro-structured optical fibre according to claim 19, wherein said range of wavelengths includes wavelengths down to 0.3 μm.

21. A micro-structured optical fibre according to any of the claims 1-20, wherein a part of or all of the core features have cross-sectional dimensions perpendicular to said axial direction being smaller than the cross-sectional dimensions of the cladding features.

22. A micro-structured optical fibre according to any of the claims 1-21, wherein a part of or all of the core features have a centre-to-centre spacing being smaller than said predetermined wavelength.

23. A micro-structured optical fibre according to claim 22, wherein a part of or all of the core features have a centre-to-centre spacing being smaller than 0.9 times the predetermined wavelength, such as 0.6 times, such as smaller than 0.4 times, or such as smaller than 0.2 times.

24. A micro-structured optical fibre according to any of the claims 1-23, wherein a part of or all of the core features have cross-sectional dimensions perpendicular to said axial direction being smaller than said predetermined wavelength.

25. A micro-structured optical fibre according to claim 24, wherein a part of or all of the core features have cross-sectional dimensions perpendicular to said axial direction being smaller than 0.9 times the predetermined wavelength, such as 0.6 times, such as smaller than 0.4 times, or such as smaller than 0.2 times.

26. A micro-structured optical fibre according to any of the claims 21-25, wherein the core features have a cross-sectional dimension perpendicular to said axial direction being so large that a second-order mode of propagation is shifted to a wavelength of light being shorter or smaller than said predetermined wavelength.

27. A micro-structured optical fibre according to claim 26, wherein a part of or all of the core features have a cross-sectional dimension being larger than 0.2 m.

28. A micro-structured optical fibre according to claim 26 or 27, wherein a part of or all of the core features have a cross-sectional dimension perpendicular to said axial direction being so large that the second-order mode of propagation is shifted to a wavelength of light being shorter or smaller than 1.5 μm, such as smaller than 1.3 μm, or such as smaller than 1.06 μm, such as smaller than 0.8 μm, or such as smaller than 0.6 μm, such as smaller than 0.4 μm, such as smaller than 0.3 μm, or such as smaller than 0.2 μm.

29. A micro-structured optical fibre according to any of the claims 24-28, wherein a part of or all of the core features have a cross-sectional dimension perpendicular to said axial direction larger than 0.2 μm, such as in the range of 0.2 μm to 0.4 μm, such as in the range of 0.4 μm to 1.0 μm, or such as in the range of 1.0 μm to 1.8 μm.

30. A micro-structured optical fibre according to any of the claims 2-29, wherein the fibre has been dimensioned so that the value of the effective index of refraction of the cladding region, $N_{cl}$, is larger than the effective index of refraction of the core region, $N_{co}$, for wavelengths of lights below a shifting wavelength, said shifting wavelength having a value smaller than said predetermined wavelength.

31. A micro-structured optical fibre according to claim 30, wherein said shifting wavelength has a value below 1.5 μm, such as below 1.3 μm, such as below 1.06 μm, such as below 0.8 μm, such as below 0.6 μm, or such as below 0.4 μm.

32. A micro-structured optical fibre according to any of the claims 1-31, wherein the core features in the cross section occupy in total a ratio $F_c$ of the core region, and the cladding features in the cross section occupy in total a ratio $F_i$ of the cladding region, and $F_c$ is smaller than $F_i$.

33. A micro-structured optical fibre according to claim 1 or any of the claims 2-21, wherein the cladding features are periodical features.

34. A micro-structured optical fibre according to claim 33, wherein the effective index of refraction of the core region, $N_{co}$, is lower than the effective index of refraction of the cladding region, $N_{cl}$, at said predetermined wavelength of light.

35. A micro-structured optical fibre according to any claims 33 or 34, wherein the core features have cross-sectional dimensions perpendicular to said axial direction being larger than the cross-sectional dimensions of the cladding features.

36. A micro-structured optical fibre according to any of the claims 33-35, wherein the core features in the cross section occupy in total a ratio $F_c$ of the core

region, and the cladding features in the cross section occupy in total a ratio $F_i$ of the cladding region, and $F_c$ is larger than $F_i$.

37. A micro-structured optical fibre according to any of the preceding claims, wherein the core features have a centre-to-centre spacing being substantially equal to the centre-to-centre spacing of the cladding features.

38. A micro-structured optical fibre according to any of the claims 1-36, wherein the core features have a centre-to-centre spacing being smaller than the centre-to-centre spacing of the cladding features.

39. A micro-structured optical fibre according to any of the preceding claims, wherein the number of core features is larger than 2, such as larger than 5, such as larger than 17.

40. A micro-structured optical fibre according to any of the claims 1-38, wherein the number of core features is equal to 7 or equal to 13 or equal to 19.

41. A micro-structured optical fibre according to any of the claims 1-40, wherein the refractive index of the core material is lower than the refractive index of the cladding material.

42. A micro-structured optical fibre according to any of the claims 1-40, wherein the refractive index of the core material is substantially equal to the refractive index of the cladding material.

43. A micro-structured optical fibre according to any of the claims 1-40, wherein the refractive index of the core material is higher than the refractive index of the cladding material.

44. A micro-structured optical fibre according to claim 42, wherein the core material and the cladding material are made of the same material.

45. A micro-structured optical fibre according to any of the claims 1-44, wherein at least 60%, such as at least 80%, or such as all of the cladding features have a cross-sectional dimension perpendicular to said axial direction being larger than the wavelength of light guided by said fibre.

46. A micro-structured optical fibre according to any of the preceding claims, wherein the core region has a diameter larger than 2 μm.

47. A micro-structured optical fibre according to claim 46, wherein the core region has a diameter in the range of 2 – 50 μm, such as in the range from 2 – 5 μm, such as in the range from 5 – 10 μm, such as in the range from 10 – 25 μm, such as in the range from 25 – 50 μm,

48. A micro-structured optical fibre according to any of the preceding claims, wherein the cladding features have a diameter or a cross-sectional dimension being larger than 0.45 times the centre-to-centre spacing of said cladding

features, such as larger than 0.6 times the cladding feature spacing, or such as larger than 0.9 times the cladding feature spacing.

49. A micro-structured optical fibre according to any of the preceding claims, wherein the cladding features occupy at least 25% of the cross-section of the cladding region, such as more than 40%, such as more than 50%, such as more than 60%, such as more than 70%, such as more than 80%.

50. A micro-structured optical fibre according to any of the preceding claims, wherein the core features occupy more than 5% of the cross-section of the core region, such as more than 10%, such as more than 25%, such as more than 50%, such as more than 75%.

51. A micro-structured optical fibre according to any of the preceding claims, wherein the core features are periodical features.

52. A micro-structured optical fibre according to any of the preceding claims, wherein the spacing of the core features and/or the cladding features are in the range of about 0.2 μm to 10 μm.

53. A micro-structured optical fibre according to any of the preceding claims, wherein the core material and/or the first cladding material is silica.

54. A micro-structured optical fibre according to any of the preceding claims, wherein one or more of the core features are rods.

55. A micro-structured optical fibre according to claim 54, wherein a majority or all of the core features are rods.

56. A micro-structured optical fibre according to any of the preceding claims, wherein one or more of the cladding features are rods.

57. A micro-structured optical fibre according to claim 56, wherein a majority or all of the cladding features are rods.

58. A micro-structured optical fibre according to any of the claims 55-57, wherein some or all of the rods of the core features and/or the cladding features are made of silica.

59. A micro-structured optical fibre according to claim 58, wherein one or more of the silica core features and/or cladding features are doped with one or more materials selected from a list comprising: Ge, Al, F, Er, Yb, Nd, La.

60. A micro-structured optical fibre according to any of the preceding claims, wherein one or more of the core features are voids.

61. A micro-structured optical fibre according to any of the claims 1-54 or 56-60, wherein a majority or all of the core features are voids.

62. A micro-structured optical fibre according to any of the preceding claims, wherein one or more of the cladding features are voids.

63. A micro-structured optical fibre according to any of the claims 1-56 or 58-62, wherein a majority or all of the cladding features are voids.

64. A micro-structured optical fibre according to any of the claims 60-63, wherein the voids of the core region and/or the cladding region contain air, another gas, or a vacuum.

65. An article according to any of the claims 60-63, wherein any of the core features and/or the cladding features are voids containing polymer(s), a material providing an increased third-order non-linearity, a photo-sensitive material, or a rare earth material.

66. An article comprising a micro-structured optical fibre for guiding light at an operating wavelength, said optical fibre having an axial direction and a cross section perpendicular to said axial direction, the optical fibre comprising: a core region having en effective refractive index $N_{co}$ and being surrounded by a cladding region comprising a multiplicity of spaced apart cladding features being elongated in the axial direction and disposed in a first cladding material, the cladding features having a refractive index that differs from a refractive index of the first cladding material, the cladding region further comprising an inner cladding region surrounding the core region and an outer cladding region

surrounding the inner cladding region, the inner cladding region having an effective refractive index $N_i$ and the outer cladding region having an effective refractive index $N_o$, with $N_i$ being larger than $N_o$ at the operating wavelength.

67. An article according to claim 66, wherein the inner cladding region comprises the first cladding material and the cladding features disposed therein, the first cladding material thereby constituting an inner cladding material and the cladding features disposed in the first cladding material constituting a multiplicity of spaced apart inner cladding features.

68. An article according to claim 67, wherein the outer cladding region comprises a multiplicity of spaced apart outer cladding features being elongated in the axial direction and disposed in an outer cladding material, the outer cladding features having a refractive index that differs from a refractive index of the outer cladding material.

69. An article comprising a micro-structured optical fibre for guiding light at an operating wavelength, said optical fibre having an axial direction and a cross section perpendicular to said axial direction, the optical fibre comprising a core region surrounded by an inner cladding region that comprises a multiplicity of spaced apart inner cladding features that are elongated in the axial direction and disposed in an inner cladding material, the inner cladding region being surrounded by an outer cladding region that comprises a multiplicity of spaced apart outer cladding features that are elongated in the axial direction and disposed in an outer material, the inner cladding features having a refractive

index that differs from a refractive index of the inner cladding material and the inner cladding region having an effective refractive index $N_i$, and the outer cladding features having a refractive index that differs from a refractive index of the outer cladding material and the outer cladding region having an effective refractive index $N_o$, wherein $N_i$ is larger than $N_o$ at the operating wavelength.

70. An article according to claim 68 or 69, wherein the core region has an effective refractive index $N_{co}$, the difference between $N_{co}$ and $N_i$ being a function of the wavelength of the guided light so that the effective index of the core region $N_{co}$ is substantially equal to the effective index of the inner cladding region $N_i$ at a wavelength referred to as the shifting wavelength, and wherein $N_i$ is larger than $N_o$ for operating wavelengths equal to or below said shifting wavelength.

71. An article according to claim 70, wherein $N_{co}$ is larger than $N_i$ for at least a range of wavelengths longer than the shifting wavelength, and $N_{co}$ is lower than $N_i$ for at least a range of wavelengths shorter than the shifting wavelength.

72. An article according to claim 70, wherein $N_{co}$ is lower than $N_i$ for at least a range of wavelengths longer than the shifting wavelength, and $N_{co}$ is higher than $N_i$ for at least a range of wavelengths shorter than the shifting wavelength.

73. An article according to claim 71 or 72, wherein $N_i$ is larger than $N_o$ for a range of wavelengths above the shifting wavelengths.

74. An article according to any of the claims 67-73, wherein the core region is a substantially solid core made of a core material and having an effective refractive index $N_{co}$ being substantially equal to the refractive index of the core material.

75. An article according to any of the claims 67-73, wherein the core region comprises a multitude of spaced apart core features being elongated in the axial direction and disposed in a core material.

76. An article according to any of the claims 68-75, wherein all or at least part of the inner cladding features have a cross-sectional dimension being smaller than a cross-sectional dimension of the outer cladding features.

77. An article according to any of the claims 68-76, wherein the centre-to-centre spacing between inner and outer cladding features is substantially identical.

78. An article according to any of the claims 67-77, wherein the refractive index of the core material is lower than the refractive index of the inner cladding region material.

79. An article according to any of the claims 68-78, wherein the inner cladding features in the cross-section occupy in total a ratio, $F_i$, of the inner cladding region and the outer cladding features in the cross-section occupy in total a ration, $F_o$, of the outer cladding region, and $F_i$ is smaller than $F_o$.

80. An article according to any of the claims 68-75 or 79, wherein all or at least part of the inner cladding features have a cross-sectional dimension being substantially identical to a cross-sectional dimension of all or at least part of the outer cladding features.

81. An article according to claim 80, wherein the centre-to-centre spacing between inner cladding features is larger than the centre-to-centre spacing between outer cladding features.

82. An article according to any of the claims 68-81, wherein the number of inner cladding features is lower than 6, such as equal to 4, such as equal to 3, such as equal to 2.

83. An article according to any of the claims 67-82, wherein the refractive index of the inner cladding material is substantially identical to or larger than the refractive index of the outer cladding material.

84. An article according to any of the claims 68-75, wherein the refractive index of the inner cladding material is larger than the refractive index of the outer cladding material and the inner cladding features in the cross-section occupy an area, $F_i$, of the inner cladding region and the outer cladding features in the cross-section occupy an area, $F_o$, of the outer cladding region, and $F_i$ is equal to or larger than $F_o$.

85. An article according to any of the claims 67-84, wherein the refractive index of one or more of the inner cladding features is higher than the refractive index of the inner cladding material.

86. An article according to claim 85, wherein the refractive index of a majority or all of the inner cladding features is higher than the refractive index of the inner cladding material.

87. An article according to any of the claims 67-84, wherein the refractive index of one or more of the inner cladding features is lower than the refractive index of the inner cladding material.

88. An article according to claim 87, wherein the refractive index of a majority or all of the inner cladding features is lower than the refractive index of the inner cladding material.

89. An article according to claim 66, wherein the outer cladding region comprises the first cladding material and the cladding features disposed therein, the first cladding material thereby constituting an outer cladding material and the cladding features disposed in the first cladding material constituting a multiplicity of spaced apart outer cladding features.

90. An article according to claim 89, wherein the core region comprises a multitude of spaced apart core features being elongated in the axial direction and disposed in a core material.

91. An article according to claim 90, wherein the refractive index of the core features is larger than the refractive index of the inner cladding material, and the refractive index of the core material is lower than the refractive index of the inner cladding material.

92. An article according to claim 90, wherein the refractive index of the core features is lower than the refractive index of the inner cladding material, and the refractive index of the core material is larger than the refractive index of the inner cladding material.

93. An article according to any of the claims 90-92, wherein the inner cladding region comprises an inner cladding material with the refractive index of said inner cladding material being larger than the refractive index of the outer cladding features.

94. An article according to claim 93, wherein the refractive index of the inner cladding material is about equal to or larger than the refractive index of the outer cladding material.

95. An article according to any of the claims 68-94, wherein the refractive index of one or more of the outer cladding features is higher than the refractive index of the outer cladding material.

96. An article according to claim 95, wherein the refractive index of a majority or all of the outer cladding features is higher than the refractive index of the outer cladding material.

97. An article according to any of the claims 68-94, wherein the refractive index of one or more of the outer cladding features is lower than the refractive index of the outer cladding material.

98. An article according to claim 97, wherein the refractive index of a majority or all of the outer cladding features is lower than the refractive index of the outer cladding material.

99. An article according to any of the claims 75-88 or 90-98, wherein the refractive index of one or more of the core features is higher than the refractive index of the core material.

100. An article according to any of the claims 75-88 or 90-98, wherein the refractive index of one or more of the core features is lower than the refractive index of the core material.

101. An article according to any of the claims 66-77 or 79-100, wherein the refractive index of the core material is substantially identical to the refractive index of the inner cladding region material.

102. An article according to any of the claims 66-101, wherein the refractive index of the core material is substantially identical to the refractive index of the outer cladding region material.

103. An article according to any of the claims 75-102, wherein the core features have a cross-sectional dimension that is smaller than a cross-sectional dimension of the inner cladding features.

104. An article according to any of the claims 75-103, wherein the core features have a centre-to-centre spacing that is smaller than the centre-to-centre spacing of the inner cladding features.

105. An article according to any of the claims 68-104, wherein the outer cladding features occupy more than 30% of the cross-section of the outer cladding region, such as more than 40%, such as more than 50%, such as more than 60%, such as more than 70%, such as more than 80%.

106. An article according to any of the claims 67-105, wherein the inner and/or outer cladding features are periodically disposed.

107. An article according to any of the claims 75-88 or 90-106, wherein the core features are periodical core features.

108. An article according to any of the claims 66-107, wherein the core has a diameter larger than 2 m.

109. An article according to claim 108, wherein the core diameter is in the interval from 2 to 10 m, such as in the interval from 4 to 6 m.

110. An article according to any of the claims 66-109, wherein the inner and/or outer cladding features have a spacing in the range of about 0.1 to 10 times the wavelength of any light guided through the fibre, such as in the range of about 0.5 to 1, such as in the range of about 1 to 2, such as in the range of about 2 to 5, such as in the range of about 5 to 10.

111. An article according to any of the claims 75-88 or 90-110, wherein the core features have a spacing in the range of about 0.1 to 10 times the wavelength of any light guided through the fibre, such as in the range of about 0.5 to 1, such as in the range of about 1 to 2, such as in the range of about 2 to 5, such as in the range of about 5 to 10.

112. An article according to any of the claims 75-88 or 90-111, wherein the core features have a spacing in the range of about 0.1 m to 10 m, such as in the range of about 0.5 m to 1 m, such as in the range of about 1 m to 2 m, such as in the range of about 2 m to 5 m, such as in the range of about 5 m to 10 m.

113. An article according to any of the claims 75-88 or 90-112, wherein one or more of the core features are voids.

114. An article according to claim 113, wherein a majority or all of the core features are voids.

115. An article according to any of the claims 67-88 or 95-114, wherein one or more of the inner cladding features are voids.

116. An article according to claim 115, wherein a majority or all of the inner cladding features are voids.

117. An article according to any of the claims 68-116, wherein one or more of the outer cladding features are voids.

118. An article according to claim 117, wherein a majority or all of the outer cladding features are voids.

119. An article according to any of the claims 113-118, wherein one or more of the core features and/or the cladding features are voids containing air, another gas, or a vacuum.

120. An article according to any of the claims 75-88 or 90-113 or 115-119, wherein one or more of the core features are rods.

121. An article according to claim 120, wherein a majority or all of the core features are rods.

122. An article according to any of the claims 67-88 or 95-115 or 117-121, wherein one or more of the inner cladding features are rods.

123. An article according to claim 122, wherein a majority or all of the inner cladding features are rods.

124. An article according to any of the claims 68-117 or 119-123, wherein one or more of the outer cladding features are rods.

125. An article according to claim 124, wherein a majority or all of the outer cladding features are rods.

126. An article according to any of the claims 113-125, wherein one or more of the core features and/or the cladding features are voids containing polymer(s), a material providing an increased third-order non-linearity, a photo-sensitive material, or a rare earth material.

127. An article according to any of the preceding claims, wherein the fibre guides light at a predetermined wavelength in a single mode.

128. An article according to claim 127, wherein said predetermined wavelength is in the range from about 0.3 m to 15 m, such as from about 0.5 m to 1.6 m, such as around 0.8 m, such as around 1.06 m, such as around 1.3 m, such as around 1.5 m, such as from about 1.0 m to 2.0 m, such as from about 2 m to 5 m, such as from about 5 m to 15 m.

129. An article according to claim 128, wherein the fibre guides light at several predetermined wavelengths.

130. An article according to claim 67 or 68, wherein the core region is a substantially solid core made of a core material and having an effective refractive index $N_{co}$ being larger than $N_i$ at the operating wavelength.

131. An article comprising a micro-structured optical fibre for guiding light at an operating wavelength, said optical fibre having an axial direction and a cross section perpendicular to said axial direction, the optical fibre comprising a core region having an effective refractive index $N_{co}$ and being surrounded by an inner cladding region that comprises a multiplicity of spaced apart inner cladding features that are elongated in the axial direction and disposed in an inner cladding material, the inner cladding region being surrounded by an outer cladding region that comprises a multiplicity of spaced apart outer cladding features that are elongated in the axial direction and disposed in an outer material, the inner cladding features having a refractive index that differs from a refractive index of the inner cladding material and the inner cladding region having an effective refractive index $N_i$, and the outer cladding features having a refractive index that differs from a refractive index of the outer cladding material and the outer cladding region having an effective refractive index $N_o$, wherein:

$N_i$ is larger than $N_o$ at the operating wavelength, the core region is a substantially solid core with a core diameter around or below 4 μm and with an effective refractive index $N_{co}$ being larger than $N_i$ at the operating wavelength, the centre to centre spacing or pitch of the inner cladding features, $\Lambda_i$, is around or below 2 μm, the inner cladding features have a diameter or cross sectional dimension, $d_i$, fulfilling the requirement that $d_i/\Lambda_i$ is equal to or below 0.7 and equal to or above 0.2, the centre to centre spacing or pitch of the outer cladding features, $\Lambda_o$, is around or below 2 μm, and the outer cladding features have a diameter or cross sectional dimension, $d_o$, fulfilling the requirement that $d_o/\Lambda_o$ is equal to or above 0.4.

132. An article according to claim 130 or 131, wherein $N_{co}$ is larger than $N_i$ for all wavelengths of optical radiation which can be guided by the micro-structured fibre.

133. An article according to any of the claims 130-132, wherein the effective refractive index difference between the core region and the inner cladding region is greater than about 5%.

134. An article according to any of the claims 130-133, wherein the core region and the inner cladding region are mutually adapted so that the micro-structured fibre exhibits a substantially zero dispersion or near-zero dispersion wavelength within the range of 1.2 μm to 1.8 μm, such as within the range of 1.48 μm to 1.62 μm, such as within the range of 1.52 μm to 1.58 μm.

135. An article according to any of the claims 130-134, wherein the centre to centre spacing or pitch of the inner cladding features, $\Lambda_i$, is around or below 2 μm, such as around or below 1.5 μm, such as around 1.4 μm, or in the range of 1 μm to 2 μm, such as in the range of 1 μm to 1.5 μm.

136. An article according to any of the claims 130-137, wherein the number of inner cladding features is higher than or equal to 6.

137. An article according to claim 136, wherein the inner cladding features have a diameter or cross sectional dimension, $d_i$, and a centre to centre spacing or pitch, $\Lambda_i$, fulfilling the requirement that $d_i/\Lambda_i$ is in the range from 0.2 to 0.4, such as about 0.3.

138. An article according to any of the claims 130-137, wherein the centre to centre spacing or pitch of the outer cladding features, $\Lambda_o$, is substantially equal to the centre to centre spacing or pitch of the inner cladding features, $\Lambda_i$.

139. An article according to any of the claims 130-135, wherein all or at least part of the inner cladding features have a diameter or cross-sectional dimension being substantially identical to a diameter or cross-sectional dimension of all or at least part of the outer cladding features.

140. An article according to claim 139, wherein the number of inner cladding features is lower than 6, such as equal to 4, such as equal to 3, such as equal to 2.

141. An article according to claim 139 or 140, wherein the centre to centre spacing between inner cladding features $\Lambda_i$ is larger than the centre to centre spacing between outer cladding features $\Lambda_o$.

142. An article according to claim 141, wherein the inner cladding features have a diameter or cross sectional dimension, $d_i$, and a centre to centre spacing or pitch, $\Lambda_i$, fulfilling the requirement that $d_i/\Lambda_i$ is in the range from 0.25 to 0.5.

143. An article according to claim 141, wherein the inner cladding features have a diameter or cross sectional dimension, $d_i$, fulfilling the requirement that $d_i/\Lambda_i$ is in the range from 0.28 to 0.57.

144. An article according to claim 141, wherein the inner cladding features have a diameter or cross sectional dimension, $d_i$, and a centre to centre spacing or pitch, $\Lambda_i$, fulfilling the requirement that $d_i/\Lambda_i$ is in the range from 0.35 to 0.7.

145. An article according to any of the claims 130-144, wherein the centre to centre spacing or pitch of the outer cladding features, $\Lambda_o$, is around or below 2 μm, such as around or below 1.5 μm, such as around 1.4 μm, or in the range of 1 μm to 2 μm, such as in the range of 1 μm to 1.5 μm.

146. An article according to claim 144 or 145, wherein the outer cladding features have a diameter or cross sectional dimension, $d_o$, fulfilling the requirement that $d_o/\Lambda_o$ is equal to or below 0.7 and equal to or above 0.4, such as about 0.5 or such as about 0.6.

147. An article according to any of the claims 130-146, wherein the core has a diameter around or below 4 μm, such as around or below 3.6 μm, such as around or below 2 μm, such as around or below 1.5 μm.

148. An article according to any of the claims 130-147, wherein the refractive index of the core region is varying along the diameter of the core region so that an inner and/or a central portion of the core has a higher refractive index than an outer portion of the core.

149. An article according to claim 148, wherein the inner and/or central portion of the core comprises one or more rods having a higher refractive index than the background index of the core or the outer portion of the core.

150. An article according to claim 148 or 149, wherein the inner and/or central portion of the core has a higher refractive index than the refractive index of the inner cladding material and/or the outer cladding material.

151. An article according to any of the claims 130-150, wherein at least part of the core region has a refractive index being substantially identical to the refractive index of the inner and/or outer cladding region material.

152. An article according to any of the claims 130-150, wherein at least part of the core region has a refractive index being larger than the refractive index of the inner and/or outer cladding region material.

153. An article according to any of the claims 130-150, wherein at least part of the core region has a lower refractive index than the refractive index of the inner cladding material and/or the outer cladding material

154. An article according to any of the claims 130-153, wherein the inner cladding features are voids and/or rods having a lower refractive index than the inner cladding material.

155. An article according to any of the claims 130-154, wherein the outer cladding features are voids and/or rods having a lower refractive index than the outer cladding material.

156. An article according to any of the claims 130-138 or 140-155, wherein all or at least part of the inner cladding features have a cross-sectional dimension being smaller than a cross-sectional dimension of the outer cladding features.

157. An article according to any of the claims 130-156, wherein the refractive index of the inner cladding material is substantially identical to the refractive index of the outer cladding material.

158. An article according to any of the claims 130-157, wherein the inner cladding features in the cross-section occupy in total a ratio, $F_i$, of the inner cladding region and the outer cladding features in the cross-section occupy in total a ration, $F_o$, of the outer cladding region, and $F_i$ is smaller than $F_o$.

159. An article according to any of the claims 130-158, wherein one or more of the cladding features are voids containing air, another gas, or a vacuum.

160. An article according to any of the claims 130-158, wherein one or more of the cladding features are voids containing polymer(s), a material providing an increased third-order non-linearity, a photo-sensitive material, or a rare earth material.

161. An article according to any of the preceding claims, wherein the core region and/or the cladding regions comprise silica.

162. An article according to any of the preceding claims, wherein the core and/or any of the cladding materials contains polymer(s), are material(s) providing an increased third-order non-linearity, are photo-sensitive material(s), or are rare earth material(s).

163. An article according to any of the preceding claims, wherein said fibre is dimensioned to guide light of predetermined wavelength in two substantially, non-degenerate polarization states.

164. An article according to any of the preceding claims, wherein the fibre is characterized by a birefringence of at least $10^{-5}$, such as of at least $10^{-4}$, such of as at least $10^{-3}$.

165. An article according to any of the preceding claims, wherein the core region has a substantially two-fold symmetry, obtained from arrangement of the core features in a substantially two-fold symmetric manner.

166. An article according to any of the preceding claims, wherein the core region contains core features with a non-circular symmetric shape in the fibre cross-section.

167. An article according to any of the preceding claims, wherein the shape of the core region deviates substantially from a circular shape in the fibre cross-section.

168. An article according to any of the preceding claims, wherein shape of the core region deviates substantially from a quadratic shape, a hexagonal shape, or a higher order polynomial shape in the fibre cross-section.

169. An article according to any of the preceding claims, wherein shape of the core region is substantially rectangular in the fibre cross-section.

170. An article according to any of the preceding claims, wherein the core region and/or cladding region has substantially a 180 degree rotational symmetry in the fibre cross-section.

171. An article according to any of the claims 1-166 or 170, wherein shape of the core region is essentially circular or elliptical.